

Preface

In an earlier book, *The Geology of Fluvial Deposits* (1996), I set out in detail modern methods of facies and architectural analysis of fluvial deposits, and used numerous case studies to illustrate the architecture of fluvial systems, on scales ranging from that of the outcrop to that of entire basins. Chapters were devoted to the tectonic and climatic controls on fluvial deposition, and an attempt was made to erect a classification of nonmarine oil and gas fields based on the stratigraphy and architecture of the fluvial reservoirs.

In subsequent years, a host of new case studies has provided much material for refining our understanding of allogenic controls, and has substantially improved our ability to apply sequence-stratigraphic methods to fluvial systems. Exploration techniques used for petroleum exploration and development have become much more sophisticated, and in my view, are steadily reducing the need for much of the statistically based modeling work that is carried out during the reservoir development process, in favor of the detailed mapping of what is actually there, using such techniques as three-dimensional seismic reflection, and the careful analysis of production data, such as pressure-depth relationships.

One of the major foundations of sedimentological work has been the analogue method, whereby the processes and products of modern and very recent sedimentary environments form the basis for comparison with the ancient record. However, our increasing ability to develop accurate ages for the rock record has raised an important question about the validity of the analogue method, which forms the basis for one of the fundamental principles of geology, that of uniformitarianism. The fragmentary nature of preserved stratigraphies is increasingly apparent, and it is clear that comparisons to the ancient record based on studies of post-glacial stratigraphy, such as the great deltas and continental margin sedimentary prisms bordering modern oceans, must be carried out with a major caveat regarding questions of preservability. This is particularly the case in the area of sequence stratigraphy, an area that is examined in depth in this book as it relates to the analysis and interpretation of fluvial deposits.

The purpose of this book is to discuss the new methods and the new understanding of fluvial depositional systems, with a particular emphasis on those techniques and results that are most useful for subsurface work.

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